

WHAT IS CLAIMED IS:

5 1. In a data communication network including a plurality of data communication switches transmitting and receiving data packets, a method for processing a data packet received by one of the data communication switches, the method comprising the steps of:

10 creating a search key for the data packet;  
transmitting the search key to ones of lookup engines;  
utilizing the search key to search ones of lookup tables associated with the respective lookup engines to produce  
15 respective search results;  
comparing the respective search results for match quality;  
and  
selecting a search result based on the match quality.

20 2. The method of claim 1, wherein the step of transmitting comprises transmitting the search key concurrently to the ones of lookup engines.

25 3. The method of claim 1, wherein the step of selecting a search result comprises returning the search result with the highest match quality.

30 4. The method of claim 1, wherein the match quality indicates an exact match.

5. The method of claim 1, wherein the match quality indicates a partial match.

35

6. The method of claim 1, wherein the match quality indicates that no match was made.

5

7. The method of claim 1, wherein at least one of the search results includes data from the lookup table associated with the search key.

10

8. In a data communication network including a plurality of data communication switches transmitting and receiving data packets, a method for processing a data packet received by one of the data communication switches, the method comprising the steps of:

15

creating a search key for the data packet;

transmitting the search key to a first lookup engine;

utilizing the search key to search a lookup table associated with the first lookup engine to produce a first search result;

20

transmitting the first search result to a second lookup engine coupled to the first lookup engine to produce a second search result;

comparing the first search result with the second search result for match quality; and

25

returning one of the search results based on the match quality.

30

9. The method of claim 8, wherein the step of returning one of the search results comprises returning the search result with the highest match quality.

10. The method of claim 8, wherein the match quality indicates an exact match.

35

11. The method of claim 8, wherein the match quality indicates a partial match.

5

12. The method of claim 8, wherein the match quality indicates that no match was made.

10

13. The method of claim 8, wherein the returned one of the search results includes data from the lookup table associated with the search key.

15

14. The method of claim 8 further comprising validating the first search result by the second lookup engine.

20

15. A packet processing system including a packet processor and a plurality of lookup engines having respective data stored thereon, the lookup engines receiving a search key from the packet processor and performing a search of their respectively stored data, at least one of the lookup engines having an output for transmitting a search result to a later lookup engine in response to a search result of a prior lookup engine.

25

16. The system of claim 15, wherein the lookup engines concurrently receive a search key from the packet processor.

30

17. The system of claim 15, wherein at least one of the search results includes match quality data indicating an exact match.

35

18. The system of claim 15, wherein at least one of the search results includes match quality data indicating a partial match.

19. The system of claim 15, wherein at least one of the  
5 search results includes match quality data indicating that no  
match was made.

20. The system of claim 15, wherein the packet processor  
10 receives the one of the search results with the highest match  
quality.

21. The system of claim 15, wherein at least one of the  
15 search results includes a portion of the stored data associated  
with the search key.

22. The system of claim 15, wherein the lookup engine  
validates the search result of the prior lookup engine.

23. The system of claim 15, wherein the later lookup engine  
20 is a downstream lookup engine.

24. The system of claim 15, wherein the prior lookup engine  
25 is an upstream lookup engine.

25. A packet processing system including:  
means for receiving a data packet;  
a packet processor coupled to the means for receiving the  
data packet, the packet processor creating a search key for the  
30 data packet; and  
a plurality of lookup engines receiving the search key from  
the packet processor, at least one of the lookup engines  
utilizing the search key to search a lookup table to produce a  
35 search result, the lookup engine comparing its search result with

a search result received from a prior lookup engine for determining which search result to validate.

5

26. The system of claim 25, wherein the lookup engines concurrently receive the search key from the packet processor.

10

27. The system of claim 25, wherein the prior lookup engine is an upstream lookup engine.

15

28. The system of claim 25, wherein the validated search result includes data from the lookup table associated with the search key.

20

29. The system of claim 25, wherein the lookup engine validates the search result of the prior lookup engine.

25

30. The system of claim 25, wherein the validated search result includes match quality data indicating an exact match.

31. The system of claim 25, wherein the validated search result includes match quality data indicating a partial match.

30

32. The system of claim 15, wherein the validated search result includes match quality data indicating that no match was made.

33. The system of claim 32, wherein the determination of which search result is validated is based on a comparison of match quality.

35